U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

PB-269 366

Impact of Natural Gas Shortage on Major Industrial Fuel-Burning Installations Volume II. Schedules (Data and Tables)

Foster Associates, Inc, Washington, D C Energy Div

Prepared for

Environmental Protection Agency, Research Triangle Park, N C Strategies and Air Standards Div

Mar 77

PB 269 366

EPA-450/3-77-017b
March 1977

IMPACT OF NATURAL GAS SHORTAGE ON MAJOR INDUSTRIAL FUEL-BURNING INSTALLATIONS - VOLUME II. SCHEDULES (DATA AND TABLES)

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U S DEPARTMENT OF COMMERCE
SPRINGFIELD VA 22161

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Waste Management
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

EPA-450/3-77-017b

IMPACT OF NATURAL GAS SHORTAGE ON MAJOR INDUSTRIAL FUEL-BURNING INSTALLATIONS - VOLUME II. SCHEDULES (DATA AND TABLES)

by

J.A. Brickhill

Energy Division
Foster Associates, Inc.
1101 Seventeenth Street, NW
Washington, D.C. 20036

Contract No. 68-02-1453

EPA Project Officer: Rayburn Morrison

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Waste Management
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

March 1977

This report is issued by the Environmental Protection Agency to report technical data of interest to a limited number of readers. Copies are available free of charge to Federal employees, current contractors and grantees, and nonprofit organizations - in limited quantities - from the Library Services Office (MD-35), Research Triangle Park, North Carolina 27711; or, for a fee, from the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161.

This report was furnished to the Environmental Protection Agency by the Energy Division, Foster Associates, Inc., 1101 Seventeenth Street, NW, Washington, D.C. 20036, in fulfillment of Contract No. 68-02-1452. The contents of this report are reproduced herein as received from Foster Associates, Inc. The opinions, findings, and conclusions expressed are those of the author and not necessarily those of the Environmental Protection Agency. Mention of company or product names is not to be considered as an endorsement by the Environmental Protection Agency.

Publication No. EPA-450/3-77-017b

ACKNOWLEDGEMENTS

This study was prepared under the direction of John Brichhill by the Energy Division of Foster Associates. Paul Wilkinson acted as assistant task manager and Wayne Mikutowics acted as technical reviewer for the study. Other technical personnel participating in the preparation of the study were Isobel Bowen, Warren Crane, George Warholic, and Ghislaine Eon.

Without the input of the Energy Strategies Branch of EPA, the chapter dealing with emissions could not have been prepared. Rayburn Morrison and C. Hai Kuo expended considerable effort to provide the necessary data base to Foster Associates. As well, the Federal Energy Administration, Office of Coal Utilization, provided the basic MFBI information pertaining to major combustors and aid with respect to the analysis thereof. We thank John Dean and his staff from that office for their assistance.

VOLUME TWO

TABLE OF CONTENTS

Schedule Number	Title	Sheets
I-1	The Gas Requirements Committee Forecast of Industrial Gas Consumption by State	1-5
I-2	Projected Gas Consumption and Shortages in Major MFBI Gas Combustors by AQCR and AQMA to 1980	1-14
II-1	Projected Alternative Fuel Use as a Result of Gas Shortages in Major MFBI Gas Combustors by AQCR and AQMA to 1980	1-17
III-1	Projected Incremental Emissions of Sulfur Dioxide and Particulates From Major MFBI Gas Combustors by AQCR and AQMA to 1980	1-14
IV-1	United States Gas Consumption by EPA Region and Sector in 1974	1-8
IV-2	Supply and Consumption of Natural Gas in the Lower 48 States, 1960-1975	1
IV-3	1974 Consumption of Energy by Stationary Users in the United States, by Sector	1-7
IV-4	Reserves Additions, Net Production and Total Proved Reserves of Natural Gas in the Lower 48 States, 1947-1974	1
IV-5	Withdrawals, Reserves Additions and Proved Reserves of Natural Gas Owned or Contracted by Interstate Pipeline Companies in the United States, 1963-1975	1
IV-6	Natural Gas Production in Major Producing Areas of the Lower 48 States	1
IV-7	Reserves Additions, Production and Finding-to-Production Ratios in Major Producing Areas of the Lower 48 States	1
IV-8	Number of Wells Drilled by Type of Well in the Lower 48 States, 1960-1975	1

Schedule Number	Title	Sheets
IV-9	Non-Associated Gas Reserves Added Per Gas and Condensate Foot Drilled, 1947-1975	1
IV-10	Comparison of Forecasts of Gas Production in the Lower 48 States	1
IV-11	Comparison of Forecasts of Total United States Gas Supply	1
IV-12	The GRC Forecast of Lower 48 Gas Supply by Component, 1974-1985	1
IV-13	The GRC Forecast of Gas Consumption by Sector and EPA Region, 1974-1980	1-2
IV-14	Sources of Gas Supply by State, 1974	1-4
IV-15	Direct Interstate Sales of Natural Gas to Major MFBI and Consumption of Natural Gas by Major Combustors at These Plants in 1974	1-2
IV-16	Comparison of Actual Requirements and Curtailments for Year September 1975 through August 1976 with Projections for Year September 1976 through August 1977	1-2
IV-17	Comparison of Industrial Gas Consumption and Shortages by State Estimated by FEA	1
IV-18	Annual Deliverability from Domestic Gas Reserves Under Contract as of January 1, 1976 for Major Interstate Pipeline Companies	1

[illegible]

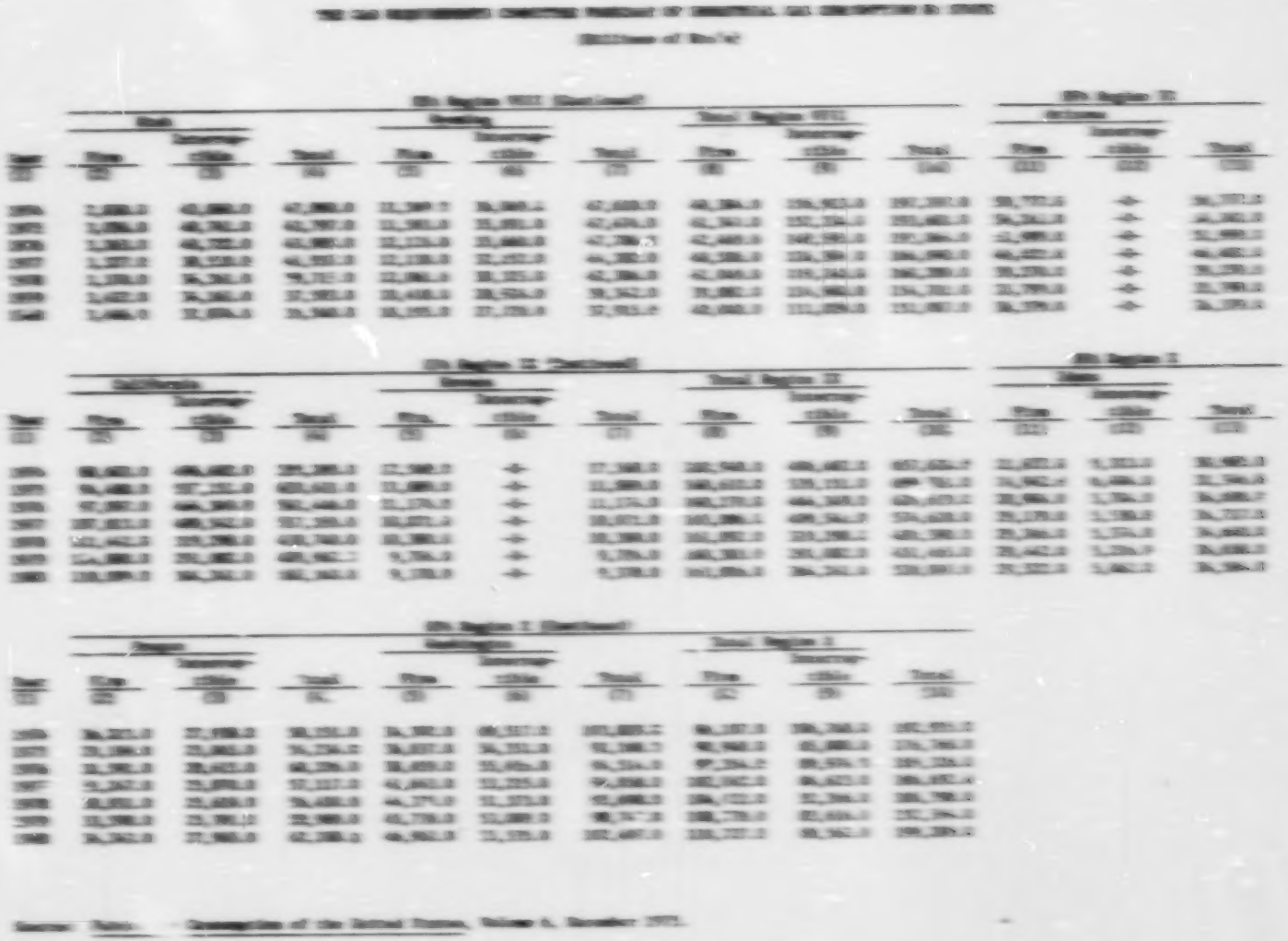
[illegible]

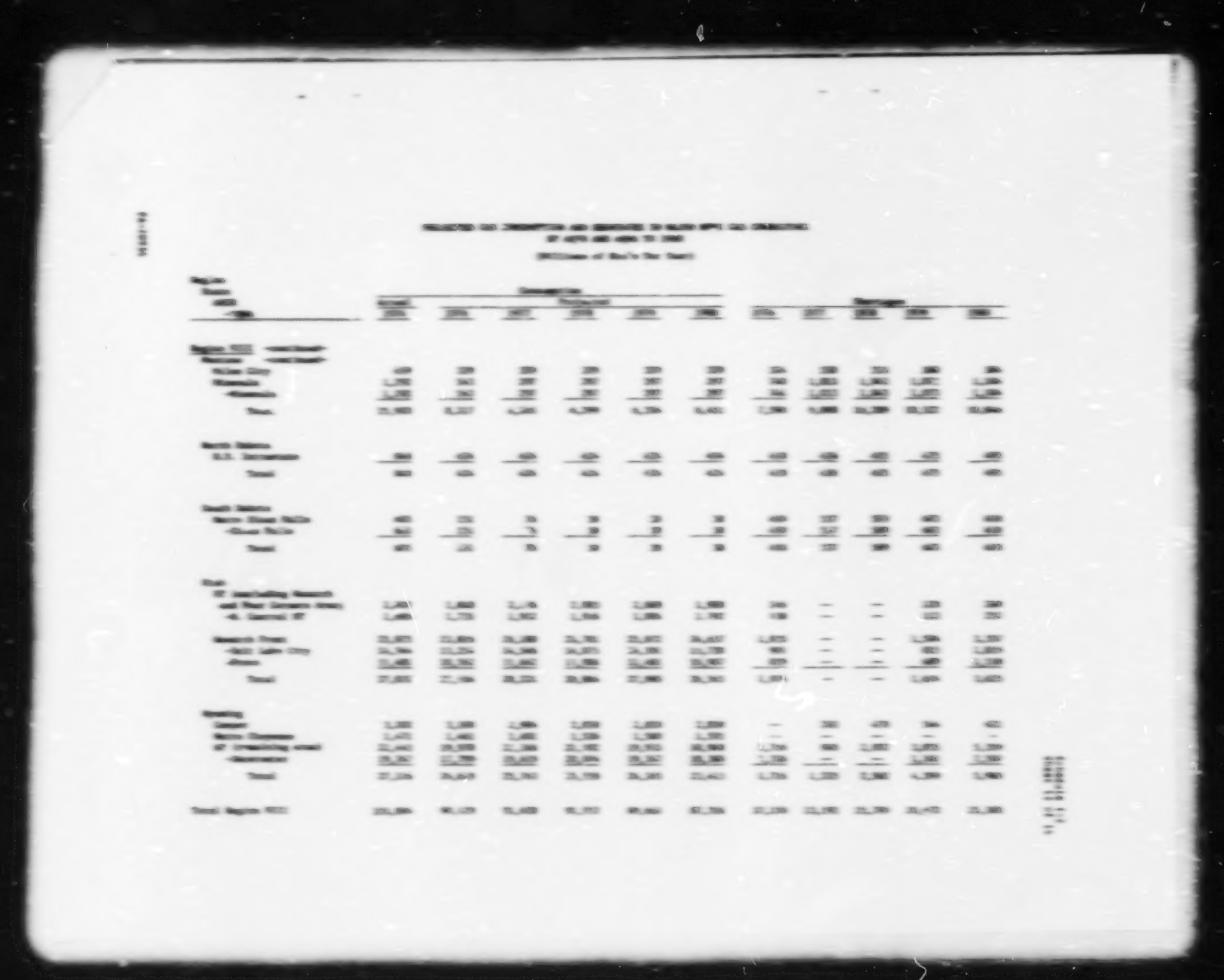
[illegible]

[redacted]

[redacted]

[redacted]





| | | |

[illegible]

[illegible]

[illegible]

| | | |

| | | |

| | | |

| | | |

[illegible] [illegible] [illegible] [illegible]

[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] a/

1960 - 1975

[illegible] in Billions of Cubic Feet at 14.73 Psia)

Year	Consumption: Delivered to Consumers: Residential and Commercial	Electric Utilities	Other Industrial	Field Use, Including Shrinkage	Other Disposition b/	Total	Supply: National Production	Net Imports c/
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1960	4,101	1,333	4,710	1,770	349	12,865	12,701	244
1961	4,302	1,815	4,647	1,871	793	13,388	13,181	207
1962	4,639	1,903	4,836	1,902	751	14,183	13,799	384
1963	4,839	2,131	5,197	2,069	954	15,049	14,662	387
1964	5,131	2,388	5,493	2,081	864	15,877	15,456	421
1965	5,343	2,554	5,757	1,989	937	16,462	16,032	430
1966	5,757	2,685	6,329	1,773	1,885	17,650	17,195	455
1967	6,053	2,739	6,988	1,934	1,854	18,648	18,157	483
1968	6,346	3,138	7,485	2,063	1,911	19,863	19,389	358
1969	6,673	3,480	7,895	2,305	1,877	21,726	20,647	679
1970	6,881	3,896	8,230	2,380	1,327	22,684	21,889	795
1971	7,130	3,983	8,482	2,358	1,340	23,273	22,371	902
1972	7,395	3,966	8,469	2,347	1,218	23,395	22,406	989
1973	7,157	3,580	9,031	2,396	1,347	23,521	22,517	1,004
1974	7,038	3,417	8,579	2,350	1,826	22,485	21,672	933
1975	7,173	3,227	7,281	2,349	1,341	20,891	19,960	933

a/ Excludes Alaska and Hawaii.
b/ Includes pipeline fuel, net additions to underground storage and transmission losses and unaccounted for.
c/ LNG and overland imports.

Source: Bureau of Mines, Minerals Yearbooks and Natural Gas, Annual.

Schedule 19-8

[redacted]

Schedule IV-4

RESERVES ADDITIONS, NET PRODUCTION AND TOTAL PROVED RESERVES OF NATURAL GAS IN THE LOWER 48 STATES a/

1947 - 1978

(Volumes in Billions of Cubic Feet at 14.73 Psia)

Year	Reserves Additions	Net Production	Finding/Production Ratio: Annual	Finding/Production Ratio: Three-Year Moving Average b/	Total Reserves, End of Year c/	Reserves-to-Production Ratio
1947	10,921	5,099	1.93		111,021	19.5
1948	13,813	5,975	1.31	2.10	111,915	20.0
1949	12,000	6,211	2.03	2.01	179,602	20.0
1950	11,993	6,853	1.73	1.93	185,183	20.9
1951	10,966	7,004	1.61	1.82	190,759	24.3
1952	14,067	8,093	1.80	1.97	198,033	23.1
1953	10,363	9,180	2.21	1.83	110,199	22.9
1954	7,857	9,375	1.02	1.81	110,561	22.3
1955	21,000	10,063	2.15	1.85	222,483	22.1
1956	24,716	10,849	2.28	2.06	236,483	21.8
1957	20,000	11,600	1.72	1.89	245,830	21.4
1958	18,897	11,193	1.69	1.69	252,761	22.1
1959	20,881	12,173	1.87	1.76	261,113	21.1
1960	13,866	13,019	1.06	1.51	262,019	20.1
1961	16,380	13,377	1.22	1.32	265,352	19.8
1962	18,788	13,835	1.38	1.39	270,043	19.5
1963	18,105	14,361	1.23	1.31	275,041	18.9
1964	20,103	15,361	1.31	1.30	279,620	18.2
1965	21,138	16,245	1.30	1.23	284,486	17.5
1966	19,366	17,478	1.10	1.18	286,386	16.4
1967	21,091	18,338	1.15	0.93	289,273	15.8
1968	12,038	19,232	0.62	0.71	281,000	14.6
1969	8,338	20,036	0.42	0.51	269,907	13.5
1970	11,103	21,016	0.51	0.43	259,010	12.3
1971	9,637	21,993	0.43	0.44	247,460	11.3
1972	9,199	22,391	0.41	0.38	234,019	10.4
1973	6,307	22,675	0.28	0.37	218,360	9.7
1974	8,111	21,173	0.38	0.37	205,296	9.7
1975	10,143	19,563	0.52		196,149	10.0

a/ Excludes Alaska where reported separately. In 1975 total gas reserves in Alaska amounted, as of December 31, to 32,001 billion cubic feet and production amounted to 151 billion cubic feet.

b/ Based on three-year moving averages of the data in Columns (1) and (2) centered on the middle year.

c/ Includes reserves held in underground storage which amounted to 4,261 billion cubic feet at the end of 1975, a net increase of 301 billion cubic feet over 1974.

Source: Reports by the American Gas Association Committee on Natural Gas Reserves.

WITHDRAWALS, RESERVES ADDITIONS AND PROVED RESERVES OF NATURAL GAS OWNED OR CONTRACTED BY INTERSTATE PIPELINE COMPANIES IN THE UNITED STATES

1963 - 1973

(Volumes in Trillions of Cubic Feet at 14.73 Psia)

Year	Reserves Additions (1)	Withdrawals (2)	Finding-Production Ratio (3)	Total Reserves, End of Year (4)	Reserves-to-Production Ratio (5)
1963	n.a.	9.4	n.a.	188.9	20.1
1964	10.6	10.0	1.1	189.2	18.9
1965	13.3	10.4	1.3	192.1	18.5
1966	14.2	11.1	1.3	195.1	17.6
1967	14.8	11.8	1.3	198.1	16.8
1968	9.5	12.6	0.8	195.0	15.5
1969	6.1	13.4	0.5	187.6	14.0
1970	0.04	14.1	n/	173.6	12.3
1971	3.0	14.3	0.1	161.3	11.4
1972	(0.2)	14.3	n/	146.9	10.3
1973	1.1	13.7	0.1	134.3	9.8
1974	(0.8)	13.0	(0.1)	120.5	9.3
1975	(0.1)	12.1	n/	108.4	9.0

n.a. = not available.
n/ = negligible.

Source: Data for 1963-1974: The Gas Supplies of Interstate Natural Gas Pipeline Companies, 1974, Table 5.

Data for 1975: Federal Power Commission, News Release No. 23306, May 20, 1976.

NATURAL GAS PRODUCTION IN MAJOR PRODUCING AREAS
LOWER 48 STATES a/
1960, 1965, 1970 and 1975
(Volumes in Trillions of Cubic Feet at 14.73 Psia)

Producing Areas	1960	1965	1970	1975	Annual Average Growth Rate 1960-1970	1960-1965	1965-1970	1970-1975	Percent of Lower 48 States Production 1960	1965	1970	1975
South Louisiana Onshore	2,226	3,178	5,102	3,369	8.7	8.1	9.3	(8.9)	17.0	20.2	23.4	18.2
Outer Continental Shelf	222	738	1,973	3,286	23.6	27.0	24.9	8.1	2.1	4.5	10.7	16.8
Total	2,448	4,888	7,775	6,853	11.6	18.8	12.8	(1.3)	19.1	24.7	33.6	35.0
Permian Basin	1,445	1,726	2,765	2,813	6.7	3.5	10.0	0.3	11.1	10.e	12.7	14.4
Texas Gulf Coast	2,826	3,560	4,867	3,188	2.9	3.4	2.4	(8.7)	21.3	22.1	18.5	16.2
Rocky Mountain	2,065	2,687	3,388	3,258	4.6	5.6	4.2	(0.3)	15.7	16.5	15.1	16.7
Other Southwest	2,262	2,172	2,134	1,437	(5.4)	(0.5)	(8.3)	(7.6)	17.2	13.4	9.8	7.3
Rocky Mountain	787	981	1,107	1,117	3.5	4.7	2.2	0.4	6.1	6.1	5.1	5.8
California	498	622	634	332	2.4	4.5	0.4	(12.1)	3.8	3.8	2.9	1.7
All Other	488	458	585	582	1.5	(1.0)	1.9	1.7	3.7	2.8	2.3	2.9
Lower 48 States	13,019	16,265	21,836	19,573	5.3	4.5	6.1	(2.2)	100.0	100.0	100.0	100.0

a/ Excludes Alaska.

Source: Reports by American Gas Association Committee on Natural Gas Reserves.

[illegible]

[illegible]

[illegible]

NUMBER OF WELLS DRILLED BY TYPE OF WELL
LOWER 48 STATES a/

1960 - 1975

WORLD OIL

Year	Productive Wells: Oil Wells: Wildcat	Productive Wells: Oil Wells: Total	Productive Wells: Gas Wells: Wildcat	Productive Wells: Gas Wells: Total	Dry Holes: Wildcat	Dry Holes: Total	Total Wells: Wildcat	Total Wells: Total
1960	563	23,345	321	5,146	8,214	18,205	9,098	46,596
1961	517	21,410	290	5,482	7,513	17,313	8,320	44,205
1962	484	21,719	260	5,349	7,107	17,053	7,946	44,121
1963	497	20,129	238	4,563	7,035	16,748	7,770	41,442
1964	538	19,903	241	4,891	7,303	17,678	8,156	42,272
1965	482	18,055	200	4,672	8,070	16,020	7,692	38,747
1966	430	16,701	250	4,317	6,297	13,162	6,977	35,680
1967	420	15,060	172	3,598	5,403	12,922	5,997	31,580
1968	386	13,908	161	3,321	6,079	12,932	6,626	30,161
1969	443	13,193	278	3,637	8,606	13,048	7,077	29,838
1970	395	12,359	209	3,222	8,377	11,122	8,981	26,703
1971	362	13,486	223	3,398	8,127	10,443	8,693	25,327
1972	607	11,129	386	4,776	8,586	11,159	8,317	27,062
1973	378	9,563	432	5,892	6,723	10,006	7,533	25,461
1974	433	13,701	681	7,031	9,804	11,859	6,733	32,591
1975	509	16,593	531	7,614	8,978	13,183	7,008	37,209

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS

Year	Oil Wells: Exploratory	Oil Wells: Total	Gas Wells: Exploratory	Gas Wells: Total	Dry Holes: Exploratory	Dry Holes: Total	Total Wells: Exploratory	Total Wells: Total
1960	1,320		886		9,509		11,695	
1961	1,155		808		8,996		10,959	
1962	1,211	NOT	769	NOT	8,793	NOT	10,773	NOT
1963	1,312	REPORTED	663	REPORTED	8,673	REPORTED	10,648	REPORTED
1964	1,215		575		8,937		10,727	
1965	938		513		7,993		9,444	
1966	1,027	18,432	576	4,161	8,676	15,760	10,279	38,336
1967	1,039	15,187	553	3,553	7,633	13,503	9,025	32,223
1968	880	14,150	429	3,378	7,172	12,967	8,481	30,495
1969	1,084	14,330	818	4,072	7,949	13,722	9,689	32,124
1970	767	12,953	680	3,835	6,386	11,240	7,833	28,028
1971	850	11,831	437	3,629	5,850	10,139	6,917	25,819
1972	884	11,294	600	4,926	6,242	11,045	7,526	27,265
1973	617	9,082	889	6,382	5,938	10,296	7,452	26,550
1974	813	12,778	1,192	7,239	6,603	11,673	8,607	31,690
1975	966	16,396	1,168	7,579	7,058	13,244	9,192	37,219

a/ Excluding Alaska.

Source: World Oil, Forecast Review issues; American Association of Petroleum Geologists, June Bulletins; American Petroleum Institute, Quarterly Review of Drilling Statistics.

NON-ASSOCIATED GAS RESERVES ADDED PER GAS AND CONDENSATE FOOT DRILLED

United States, Excluding Alaska
1947 - 1975

Year	Estimated Reserves Added (Bcf at 14.65 Psia) (1)	Gas and Condensate Footage Drilled (000 Feet) (2)	Reserves Added Per Foot Drilled: Annual (Col. (1)÷ Col. (2)) (3)	Reserves Added Per Foot Drilled: 5-Year Moving Average (4)
1947	6,463	13,269	488	
1948	7,485	12,500	599	
1949	6,866	12,860	532	
1950	9,065	14,003	647	
1951	8,470	14,508	584	571
1952	9,621	16,070	599	593
1953	15,360	19,473	789	662
1954	5,692	19,887	293	574
1955	12,767	19,589	651	579
1956	15,305	22,593	677	601
1957	16,207	24,226	669	617
1958	17,389	25,385	685	672
1959	15,084	26,512	569	649
1960	11,512	20,215	608	595
1961	14,385	29,256	492	550
1962	17,367	28,921	600	548
1963	13,367	24,695	545	522
1964	17,337	25,586	678	542
1965	18,394	24,856	740	607
1966	16,224	25,600	634	618
1967	17,378	21,440	811	678
1968	12,402	20,089	617	695
1969	6,913	21,665	319	628
1970	9,402	19,806	475	574
1971	8,612	20,062	430	531
1972	7,630	26,571	287	426
1973	5,737	32,974	173	300
1974	6,727	39,630	170	260
1975	10,001	41,984	238	220

Source: Col. (1) - 1947-1965 derived from Estimated Proved Recoverable Reserves of Natural Gas in the United States, as reported by the Committee on Natural Gas Reserves of the American Gas Association and Minerals Yearbooks, Bureau of Mines. 1966-1975 - reported by The American Gas Association.

Col. (2) - World Oil, Annual Forecast-Review issues.

Col. (4) - Computed from moving averages of data in Cols. (1) and (3).

COMPARISON OF FORECASTS OF GAS PRODUCTION IN THE LOWER 48 STATES

1973, 1980 and 1985

(Trillions of Cubic Feet)

	Actual 1973	Forecast 1973	Forecast 1980	Forecast 1985
FPC Bureau of Natural Gas (1976)				
Low	19.6	--	--	7.3
Medium	19.6	--	--	13.8
High	19.6	--	--	17.6
Gas Requirements Committee (1975)[a/]	19.6	19.7	17.5	14.0
Department of Interior (1975)	19.6	--	18.9	16.8
Federal Energy Administration				
Reference deregulation (Oil oil)	19.6	--	--	31.3
Deregulation with conservation	19.6	--	--	30.8
Optimistic deregulation	19.6	--	--	24.3
Pessimistic deregulation	19.6	--	--	16.2
Current regulation	19.6	--	--	16.9
Interstate price ceilings	19.6	--	--	16.9
Shell Oil Co.[b/]	19.6	--	17.5	16.7
American Gas Association				
Current regulation (699-R)	19.6	19.2	17.5	16.6
Current regulation (770)	19.6	--	18.1	16.1
Deregulation	19.6	--	20.1	20.4

a/ Adjusted by 1 Tcf for Canadian imports, 0.5 Tcf in 1985 for Alaskan Gas, field use, and Btu content at 1,024 Btu's/cf.
b/ Adjusted for 0.3 Tcf U. Alaskan production.

Source: FPC Bureau of Natural Gas, A Realistic View of U.S. Natural Gas Supply, December 1976; Gas Requirements Committee, Future Gas Consumption of the United States, December 1975; U.S. Department of Interior, United States Energy Through the Year 2000 (revised), December 1975; National Energy Outlook, 1976; Shell Oil, The National Energy Outlook, September 1976; American Gas Association, Gas Supply Survey, October 1976.

COMPARISON OF PROJECTS OF
TOTAL U.S. GAS SUPPLY
(Quantities Btu's)

	Actual 1975	Forecast 1985	Forecast 1985
Gas Requirements Committee	22.8	30.6	30.6
Department of Interior	22.8	30.7	30.6
FEA (Reference Deregulation)a/	22.8	--	30.0-29.0
Shell Oila/	22.8	31.0	30.0

Note: Includes field use and Alaska.

a/ Converted to Btu's at 1024 Btu's/cf.

Source: See Schedule IV-10.

Schedule 19-13

[redacted] OF LIVES OF GAS
SUPPLY BY COMPONENT
1976-1985
(Quantities of Btu's)

	Domestic Production and Canadian Imports a/ (1)	LNG (2)	Imported LNG (3)	Propane Air (4)	Total (5)
Actual 1976	20,683	124	1	21	20,830
Projected 1978	19,170	251	79	44	19,544
1977	18,584	369	105	123	19,181
1978	17,899	487	190	123	18,699
1979	17,448	609	867	124	18,818
1980	17,009	867	209	109	18,844
1985	15,137	1,409	1,403	111	18,290

a/ Excludes field use and includes Alaska.

Source: Gas Requirements Committee, Future Gas Consumption of the United States, December 1976.

Sp-21842

| | | |

Schedule IV-16
Sheet 1 of 2

[redacted]

	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

[redacted]

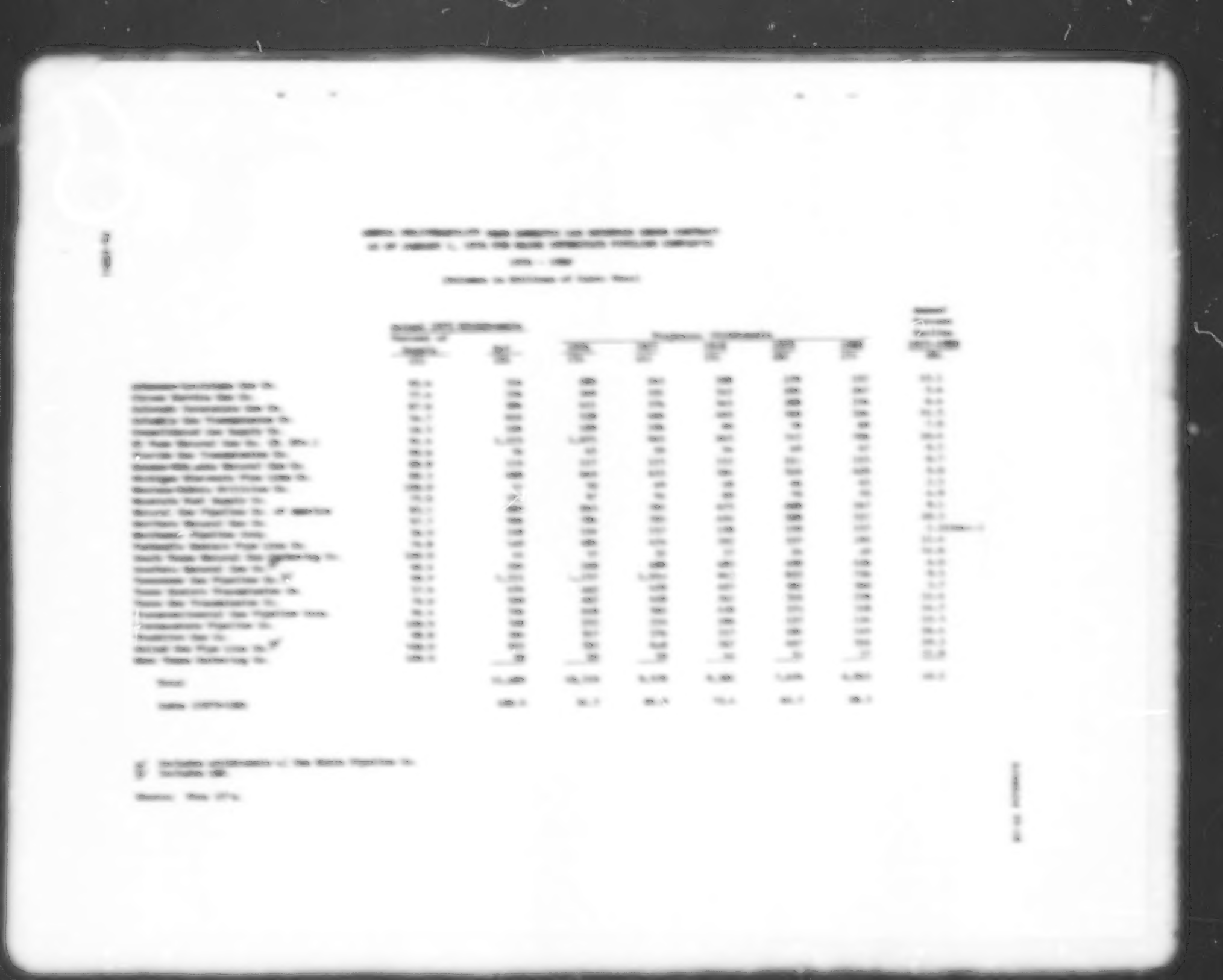
[illegible] of Industrial Gas Corporation and Subsidiaries of State Estimates of Tax

(b-f)

State	Actual Electric (Dec. 74) Corporation (1)	Actual Electric (Dec. 74) Utilities (2)	Projected Electric (Dec. 77) Corporation (3)	Projected Electric (Dec. 77) Utilities (4)	Net Change in Corporation (5)
Connecticut	1	neg.	1	neg.	(1)
Massachusetts	1	neg.	0	--	1
Maine	neg.	--	neg.	--	--
New Hampshire	0.1	neg.	0.1	neg.	--
Rhode Island	0.1	--	0.1	neg.	--
Vermont	0.0	--	0.0	--	--
New Jersey	21	14	20	20	(1)
New York	45	3	43	12	--
District of Columbia	34	--	41	--	7
Delaware	1	1	1	1	--
Maryland	20	8	18	14	(2)
Pennsylvania	113	31	110	43	3
Virginia	13	9	12	14	(1)
West Virginia	23	10	21	14	4
Alabama	34	20	14	14	(6)
Florida	31	31	31	31	--
Kentucky	23	10	21	10	(2)
Georgia	12	12	10	17	(2)
Mississippi	25	14	23	23	(2)
North Carolina	10	19	7	47	(12)
South Carolina	23	21	22	21	(1)
Tennessee	14	17	14	23	(7)
Illinois	171	27	174	35	3
Indiana	113	11	93	31	(20)
Michigan	132	3	130	7	--
Wisconsin	21	9	19	11	(2)
Ohio	134	47	126	14	(8)
Minnesota	17	7	11	13	(7)
Arkansas	12	17	14	13	(2)
Louisiana	127	21	122	15	(5)
New Mexico	17	3	14	3	(3)
Oklahoma	10	3	10	3	(1)
Texas	611	3	617	13	(6)
Iowa	14	13	11	13	(3)
Kansas	21	13	9	21	(2)
Missouri	14	13	11	14	1
Nebraska	13	3	14	3	(1)
Colorado	14	3	11	0	--
Montana	14	--	13	3	(1)
North Dakota	0.7	0.7	0.8	0.8	(0.1)
South Dakota	3	3	3	3	(1)
Utah	13	13	13	13	--
Wyoming	13	3	13	3	(1)
Arizona	17	0	13	14	(10)
California	111	21	101	21	(10)
Nevada	4	3	4	4	(1)
Idaho	13	3	13	3	--
Oregon	13	0	13	13	0
Washington	27	21	28	28	1
Total	1,830	615	1,780	847	(70)

Source: FEA, Projected Patterns for Curtailments and Financial Needs for Investor Owned Electric Utility, November 1976

Ex-C0851



TECHNICAL REPORT DATA

(Please read Instructions on the reverse before completing)

EPA-450/3-77-017b	
Impact of Natural Gas Shortage on Major Industrial Fuel-Burning Installations - Volume II. Schedules (Data and Tables)	March 1977
Driscoll, J. A.	
Energy Division Foster Associates, Inc. 1101 Seventeenth Street, N.W. Washington, D. C. 20036	68-02-1452, Task 10
U.S. Environmental Protection Agency Office of Air Quality Planning and Standards Strategies and Air Standards Division Research Triangle Park, North Carolina 27711	Contract Report
EPA Project Officer: Rayburn Harrison	

This study was conducted to analyze the impact of natural gas shortages on major fuel burning installations. The analysis consisted of the review of gas curtailments plans, natural gas supplies, FEA survey data for MFBI and applicable state air pollution control regulations. This analysis estimated the availability of natural gas through 1980 for major fuel burning installations, the alternate fuel burning capability of these plants, the need for alternate fuels such as fuel oil and coal to offset the gas shortages and the estimated increase in sulfur dioxide and particulate emissions from the burning of these alternate fuels. The study results are presented in a three volume report: the first contains the narrative for the analysis of natural gas shortages on the gas fired plants with pertinent findings and conclusions; the second contains schedules or data summaries for the natural gas fired plants; and the third presents a limited analysis of all the MFBI data.

KEY WORDS AND DOCUMENT ANALYSIS			
DESCRIPTORS		b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Fuels Natural gas curtailments Steam plants United States Government Regulations Air Pollution	Combustion Sulfur dioxide Particulates	Natural Gas Fuels Air Pollution control Stationary sources Non-Utility sources	
c. DISTRIBUTION STATEMENT		a. SECURITY CLASS (This Report)	21. NO. OF PAGES
Unlimited		Unclassified	22
		b. SECURITY CLASS (This page) Unclassified	22. PRICE PC A03 - A01

EPA Form 2220-1 (9-73)